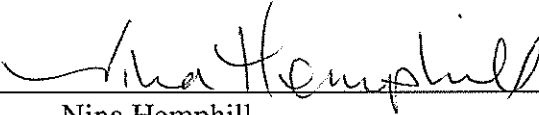


**Sequoia National Forest
Western Divide District
Biological Assessment of
Tule River Reservation Protection Project
For
Mountain Yellow-legged Frog, Northern Distinct Population
Rana muscosa, Camp, 1917**

Written by: Nina Hemphill July 2 2014

Revised August 5, 2014

Draft Biological Opinion Anticipated in August 2014

Signed  Date 8/9/2014
Nina Hemphill

SUMMARY

This Biological Assessment (BA) analyzes the potential impacts associated with implementation of the Tule River Reservation Protection Project (TRRP) Environmental Impact Statement (EIS) on the mountain yellow-legged frog. This document evaluates the preferred alternative, Alternative 3, for reducing the threat of wildfire entering the Tule River Indian Reservation from National Forest System lands. Alternative 3 responds to the major issues and concerns identified during the planning process, and utilizes a combination of treatment methods. Methods include mechanical thinning of small trees (12" or less) and brush, prescribed fire, and removal of hazard trees when deemed a health and safety risk. This work is being proposed through a request made under the Tribal Forest Protection Act instituted by Congress in 2004. The Tule River Reservation Protection Project responds to the need for an area of reduced fuel to increase protection of lands administered by Tule River Reservation from wildfire, as well as, increase fire protection around two private in-holdings on Forest Service land. This document is prepared in compliance with the requirements of FSM 2672.4 and 36 CFR 219.19.

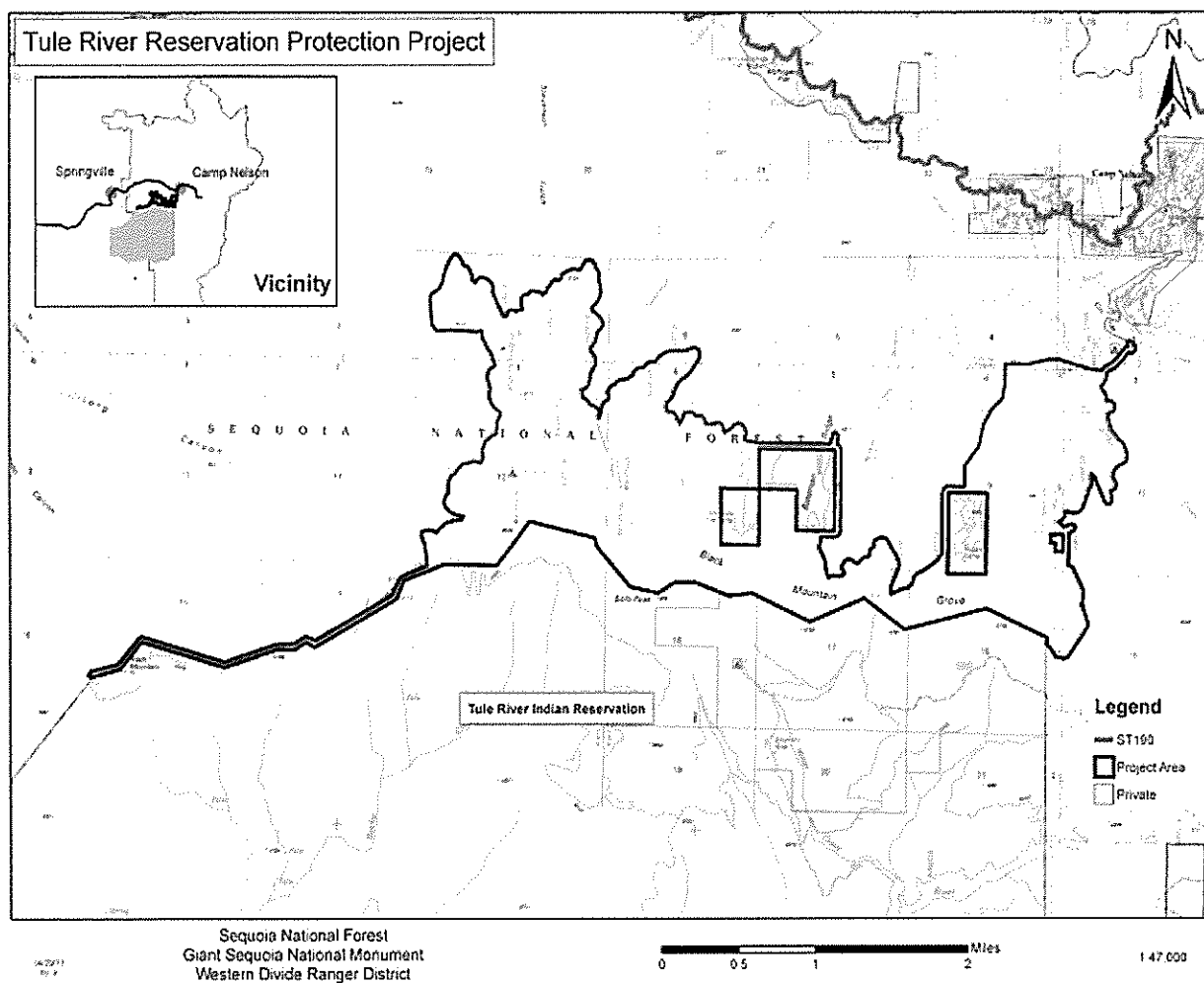
This Biological Assessment addresses only the mountain yellow-legged frog (*Rana muscosa*) in detail. Based on the analysis, the determination that Alternative 3 for the Tule River Reservation Final Environmental Impact Statement which is tiered to the Regional Biological Assessment is:

- may affect and is likely to adversely affect the mountain yellow-legged frog,
- will not affect proposed Critical Habitat for the mountain yellow-legged frog, and
- will not affect designated Suitable Habitat for the mountain yellow-legged frog

I. INTRODUCTION

The purpose of this Biological Assessment (BA) is to review the potential effects of Tule River Reservation Protection Project (TRRP Project) Environmental Impact Statement on species classified as federally endangered or threatened under the Endangered Species Act (ESA, 1973), specifically the Mountain yellow-legged frogs or their designated suitable habitat and/or proposed critical habitats. This document was prepared in accordance with the legal requirements set forth under Section 7 of the ESA (19 U.S.C 1536 (c)) and follows the standards established in Forest Service Manual direction (FSM 2672.42). The TRRP Project encompasses an estimated 2,838 acres, and is located within the Giant Sequoia National Monument on the Western Divide Ranger District in T.21 S., R.30 E., Sections 1, 12-16, and T.21 S., R. 31 E., Sections 3, 4, 6-10, and 15-18, Mount Diablo Base and Meridian (Map 1).

Map 1: Tule River Reservation Protection Project Area Vicinity Map.



The listed aquatic species occurring on the Sequoia National Forest and Giant Sequoia National Monument, and their potential to be affected by the proposed action are shown in Table 1.

Table 1. Threatened, endangered, or proposed aquatic species that may be present in Sequoia National Forest and Sequoia National Monument, their preferred habitat and elevation range, and their potential to reside in the Tule River Reservation Protection Project area.

Species	TES Status	Elevation Range of Habitat	Preferred Habitat	Potential for Project to Affect this Species
Mountain yellow-legged frog	Endangered	Above 4500 1,372 m (4500 ft)	Lakes, Ponds and perennial and intermittent streams with plunge pools	Within their elevation range. Suitable reproductive and dispersal habitat was identified and surveyed in the project area in 2013. May affect and is likely to adversely affect
Critical habitat for Mountain yellow-legged frog	Proposed	Above 1,372 m (4,500 ft)	Lakes, Ponds and perennial and intermittent streams with plunge pools	None. Critical habitat is not located within the Tule watershed area.
delta smelt	threatened	Below 500 ft	Sacramento-San Joaquin delta	None.

II. CONSULTATION TO DATE

A listing of proposed, endangered, and threatened species that may occur in the vicinity of the TRRP Project was received on July 26, 2013 from the USFWS from their website at the commencement of the project (http://www.fws.gov/sacramento/es_species/Lists/es_species_lists-overview.htm). Pursuant to Section 7(c) of the Endangered Species Act, the U. S. Fish and Wildlife Service (USFWS) website was re-accessed to obtain the current status of Mountain Yellow Legged frogs Northern DPS. As of July 1, 2014 the species was federally listed as endangered.

Designated critical habitat has also been proposed for this species (Federal Register: Vol. 78 No. 80, April 25, 2013) with an implementation date expected in late summer of 2014. None of the areas identified for critical habitat occur within the TRRP Project area.

The Tule River Reservation Protection Project was included in the USDA Forest Service Region 5 Biological Assessment for the three amphibians listed. As yet no clarifications for this project have been requested by US Fish and Wildlife Service (August 5, 2014) as part of that process. A biological opinion will be issued by the US Fish and Wildlife Service which will constitute consultation for the TRRP Project.

III. CURRENT MANAGEMENT DIRECTION

Forest Plan Direction

Direction regarding threatened, endangered and Forest Service sensitive species management and viability is provided in the Forest Service Manual (FSM 2672.1 & 2672), the National Forest Management Act (NFMA), the Code of Federal Regulations (CFR 219.19), and the 2012 Giant Sequoia National Monument Management Plan (here after Monument Plan, USDA 2012). Forest Service manual direction ensures through the Biological Evaluation/Assessment (BE/BA) process that all federal threatened, endangered, proposed, and sensitive species receive full consideration in relation to proposed activities.

The Tule River Reservation Protection Project is within Giant Sequoia National Monument and is subject to the 2012 Giant Sequoia National Monument Management Plan (Monument Plan). The Monument Plan provides strategic direction at the broad programmatic level, and it replaces, in its entirety, all previous management direction for the Monument, including the direction in the 1988 Sequoia National Forest LRMP for this part of Sequoia National Forest. The Monument Plan establishes various land allocations/management areas as Static, Overlapping, or Dynamic, and establishes standards and guidelines for each allocation based on a hierarchy basis. Where allocations overlap, the area with the most restrictive direction is given priority, as stipulated by the Monument Plan. The objectives of the GSNM Management Plan, Hydrological Resources Standards and Guidelines are to manage, improve, and protect streams and their riparian areas while implementing land and resource management activities (USDA 2012, pg 95).

Endangered Species Act (ESA)

The ESA of 1973 (16 USC 1531 et seq.) requires that any action authorized by a federal agency not be likely to jeopardize the continued existence of T&E species, or result in the destruction or adverse modification of habitat of such species that is determined to be critical. Section 7 of the ESA, as amended, requires that the responsible federal agency consult with the USFWS and the National Marine Fisheries Service concerning T&E species under their jurisdiction.

The ESA requires that a BA be written and that the analysis conducted determine whether formal consultation or conference is required with the United States Department of Interior (USDI) Fish and Wildlife Service (USFWS). This BA is prepared in compliance with the requirements of the ESA, Forest Service Manual 2670, and also provides for compliance with Code of Federal Regulations 50CFR402.12.

The Forest Service direction for Federally listed and proposed species is to manage National Forest Service habitats to achieve recovery objectives so that special protection measures provided under the Endangered Species Act (ESA) are no longer necessary (FSM 2670.13). There currently are no Recovery Plans or species specific management plans or conservation strategies for the mountain yellow-legged frog complex. However, a conservation strategy for the mountain yellow-legged frog complex has been in development since 2011 by an interagency team of managers, biologists, and researchers.

IV. DESCRIPTION OF THE PROPOSED PROJECT

The TRRP Project responds to the Tule River Tribal Council's request for action under the 2004 Tribal Forest Protection Act; to protect, restore, and maintain the Black Mountain Giant Sequoia Grove and surrounding forest, and the other objects of interest in the project area, by conducting fuels management activities in the Tribal Fuels Emphasis Treatment Area (TFETA) defined in the Monument Plan. The Forest Service developed three alternatives. These include the No Action and two additional Action Alternatives, in response to issues raised by the public. The preferred alternative (Alternative 3) is described in detail in the Tule River Reservation Protection Project Final Environmental Impact Statement (USDA Forest Service 2014) and is summarized below along with no Action.

Alternative 1

Under Alternative 1 (No Action) no fuels treatment work would be implemented to reduce surface and ladder fuels and the risk of wildland fire spreading from NFS lands onto the Tule River Indian Reservation. The purpose and need for the TRRP Project would not be achieved: the Tule River Tribal Council's request for action under the 2004 Tribal Forest Protection Act would not be granted, and no fuel treatments would be conducted to protect, restore, and maintain the Black Mountain Giant Sequoia Grove, the surrounding forest, and the other objects of interest in the project area. Existing permitted uses under the Monument Plan would continue to guide management of the project area.

Project Design Features for Riparian Conservation Areas and Streamside Management Zones (Alternative 3)

In consultation with the US Fish and Wildlife Service, the Region programmatic Biological Assessment defines suitable breeding habitat for the mountain yellow legged frog to include: permanent water bodies or those hydrologically connected with permanent water such as lakes, streams, rivers, tarns, perennial creeks (or permanent plunge pools within intermittent creeks), and pools.

In following project design features are considered a part of the Alternative 3 to fully meet the needs of the Mountain Yellow Legged Frog for suitable habitat.

Prescriptions for streamside management zones (SMZs) and special aquatic features:

- Do not conduct fuel management activities in SMZs; do not direct light within SMZs.
- Do not remove live riparian vegetation.
- Remove any slash that accidentally enters into an SMZ by hand, and pile and burn it outside of the SMZ.

Prescriptions for Riparian Conservation Areas (RCAs) outside of SMZs:

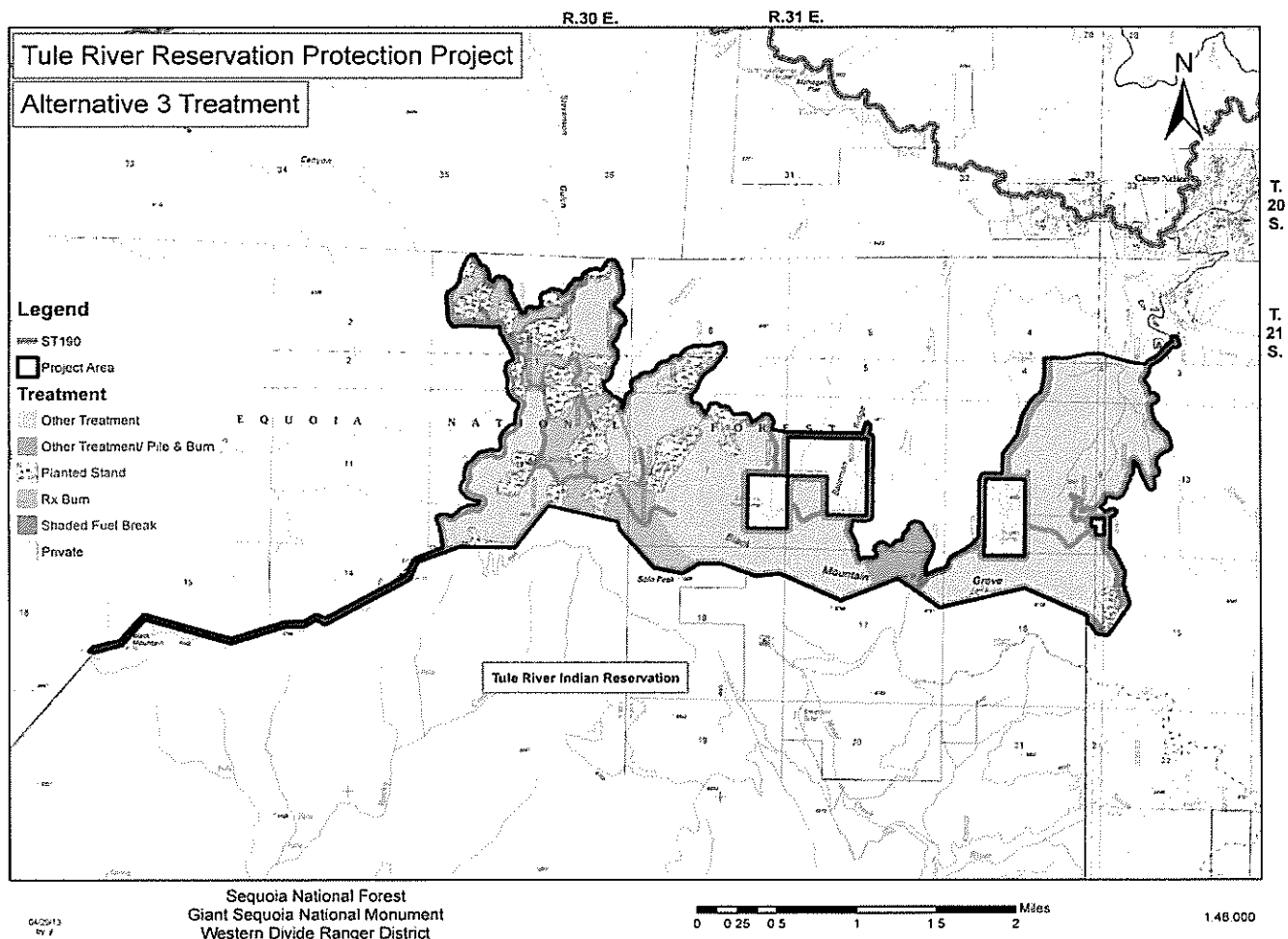
- Pending the outcome of the Biological Opinion by the USFWS, certain project sites may not warrant the following mitigation or may warrant further mitigations. However, until further direction from the Biological Opinion the following shall apply: Work within the stream/riparian corridor (defined as areas within 300-feet of any water course with standing or flowing water) shall be limited to the period between June 15 and October 15. A wet weather construction restriction (per BMP 2-3 of the Water Quality Management for Forest System Lands in California, Best Management Practices, (USDA 2000) shall be implemented to avoid potential impacts to amphibians including the Mountain Yellow-legged frog when they are more likely to be moving across land.
- Retain native riparian obligates including aspen, dogwood, alders, willows or small shrubs
- Remove small trees and brush by hand during fuel management activities.
- Pile and burn generated slash material over 150 feet from permanent streams.
- Do not place burn piles up against large woody debris or large live trees.
- Do not jackpot burn large woody debris
- Retain 10 to 20 tons of large woody debris per acre where present for the benefit of the mountain yellow legged frogs.
- To the fullest extent possible, and with due consideration given for topography, the direction trees are leaning, landings, utility lines, local obstructions, and safety factors, fell trees away from water courses.

Alternative 3

Alternative 3 was developed to address the issues of high snag density; high woody debris concentrations along Forest Roads 21S94 and 21S12; and the need to reduce the risk of fire spreading from Camp Nelson, Rogers Camp, Simmons Post Camp, Mountain Aire, and Bateman Ridge private lands, especially in the upper end of Wilson Creek. This alternative proposes to reduce surface and ladder fuels on approximately 2,830 acres in the project area (Map 2).

- Planted Stands
- Shaded Fuel Breaks
- Understory Burning
- Other Fuel Treatments

Map 2: Alternative 3 Treatment Area Map.



Planted Stands:

The TRRP project area contains approximately 400 acres of planted stands. Alternative 3 proposes to reduce fuels while creating more heterogeneity and resiliency by using hand treatments to vary spacing both in the direction of travel (i.e., upslope/downslope) and wherever possible, in alternate directions (i.e., side slope). Specific treatments include:

- Vary spacing to favor the retention of the largest trees, according to the species priority described below (in descending order of importance):

- 1) Retain all trees greater than 12 inches diameter breast height (dbh);
 - 2) Giant sequoia;
 - 3) Black oak;
 - 4) Pine
 - 5) An average of five hardwoods per acre.
- Felling trees up to 12 inches dbh following the priority list.
 - Where the largest trees are less than eight inches diameter at breast height (dbh), thin trees to 100 trees per acre (average tree spacing of 20 feet).
 - Where the largest trees are eight inches and larger, thin trees to 70 trees per acre (average tree spacing of 25 feet).
 - Removing sufficient amount of surface fuels to produce an average flame length of four feet or less by piling and burning existing dead and down material between one and eight inches dbh.
 - Limbing leave trees where necessary to reduce fire risk..
 - After previous treatments, jackpot burn and pile burn to reduce fuel loading.
 - Retaining snags greater than 15 inches dbh unless they pose an imminent threat to personnel implementing treatments.

Shaded Fuel Breaks:

Alternative 3 would use hand treatments to establish several fuel breaks on approximately 690 acres of the project area. Some of the fuel breaks would be narrower than those proposed in Alternative 2, because of the added fuel treatment areas proposed in Alternative 3. Based on terrain and vegetation features, these fuel breaks would vary from 150 to 300 feet in width:

- 1) Construct a 150 foot wide shaded fuel break along the northern boundary of the Reservation and to the east of Black Mountain.
- 2) Construct a 200 foot wide shaded fuel break (100 feet on both sides of the road) along FRs 21S94, 21S12 (from 21S94 to 21S25), 21S12B, 21S25, 21S25A, 21S25B, 21S25C, 21S25D, and 21S58.
- 3) Construct a 200 foot wide shaded fuel break on National Forest land adjacent to private property.
- 4) Construct a 300 foot wide shaded fuel break along the eastern and northwestern boundaries of the project area.

Understory Burn:

Understory burning is proposed on approximately 240 acres between the planted stands and some of the shaded fuel breaks. This prescribed burning would reduce surface fuels to retain an average of 15 tons per acre. In the burn area, hand crews would construct fire lines and prune or fell incidental small trees, generally less than six inches dbh, prior to burning. Snags greater than 15 inches dbh would be retained, unless they pose an imminent threat to personnel implementing during implementation.

Other Fuels Treatments:

In addition to the 240 acres of under burning between planted stands and the shaded fuel breaks, Alternative 3 proposes approximately 1,500 more acres of fuels reduction treatments than Alternative 2. These treatments would focus on reducing surface and ladder fuels in more of the areas between the planted stands and the shaded fuel breaks, and in the eastern portio of the project area using the following criteria:

- Remove sufficient surface fuels to produce an average flame length of less than six feet after project completion, by hand piling existing down woody material up to 8 inches in diameter.
- Remove sufficient ladder fuels, to meet an average canopy base height of 20 feet, by:
 - 1) Cutting and piling brush
 - 2) Felling and piling trees up to 12 inches dbh to achieve an average of no more than 70 trees per acre (average tree spacing of 25 feet).
- Retain snags greater than 15 inches dbh unless they pose an imminent threat to personnel implementing treatments.
- Where these fuel treatments and spotted owl protected activity centers overlap (305 acres), cut and pile brush and trees (less than inches dbh).
- After the felling and piling, use jackpot burning and pile burning to reduce fuel loading. Where these fuel treatments and fisher den buffer overlap, (approximately 45 acres), only pile and burn methods would be used.

Mitigation Measures Common to All Action Alternatives:

- Notify the Forest fish biologist or District wildlife biologist should any TES species become known during any phase of project lay out or implementation.

V. EXISTING ENVIRONMENT

The TRRP Project is located on the north facing slope of Black Mountain Giant Sequoia Grove and a portion of Slate Mountain Ridge. The entire Black Mountain Giant Sequoia Grove encompasses an estimated 3,540 acres. This includes approximately 2,370 acres found on National Forest System Lands and an estimated 1,170 acres found on Tribal Lands. The TRRP Project area encompasses an estimated 2,838 acres which include portions of Black Mountain Giant Sequoia Grove. The project area ranges in elevations approximately from 4,800 to 7,300 feet, with topography denoted by moderately steep, vegetated canyons and ridgelines, interspersed with occasional flats or rolls.

The TRRP Project encompasses a variety of vegetative communities as identified under the California Wildlife Habitat Relationship System (CWHR) (CDFG 2005). Sierran mixed conifer (SMC) is the dominant vegetation type (83%) found in the TRRP Project area. CWHR system classification of SMC vegetation type includes giant sequoias as a component. Tree species composition includes black oak, incense cedar and ponderosa pine at lower elevations, with incense cedar, sugar pine, white fir, and giant sequoia at mid to high elevations. The distribution of scattered giant sequoia trees is irregular and clumpy, typical of most groves. Understory vegetation in Sierra mixed conifer type include black oak, Pacific dogwood, Canyon live oak, beaked hazelnut, bush chinquapin, whitethorn, currant, snow berry, grasses and forbs (Jump 2004). Small inclusions of Montane Hardwood-conifer (9%), montane hardwood (8%), and brush types (<1%) occur at lower elevations and on side slopes with a northwest exposure. See Table 2 for complete listing of CWHR habitat types and acres.

Table 2. California Wildlife Habitat Relationship (CWHR) types and acres within TRRP Project Area.

CWHR Vegetation Type	Acres	Percent of project area
Sierran Mixed Conifer	2,344	83 %
Montane Hardwood-Conifer	244	9 %
Montane Hardwood	236	8 %
Barren, Montane and Mixed Chaparral	14	<1 %
Total Acreage	2,838*	100 %

* - total acreage values presented are rounded; actual acreages for any vegetation type presented may vary slightly based on rounding.

The TRRP project is located in the upper Tule River Basin. There are two 6th field HUC¹ watersheds affected by the TRRP project. Table 3 displays each 6th field HUC watershed by name and code, its corresponding 7th field sub-watersheds, stream class, beneficial uses, and approximate acres.

Table 3. Affected Watersheds in the Upper Tule River Basin

River Basin	6th Field HUC Watershed (name/#)	7th Field HUC Name/#	Stream Class	Beneficial Uses (Existing)	Acres
Upper Tule 180300060	Middle Fork Tule River 1803000601	Deep Canyon (4CA)	IV	Agriculture, Freshwater	1234
		Long Canyon (4CB)	III	Agriculture, Recreation, Wildlife, Freshwater	2608
		Coffee Canyon (4CC)	IV	Fresh Water	1521
		Headwaters of Long Canyon (4CD)	III	Recreation, Wildlife, Freshwater	1760
		Stevenson Gulch (4DA)	III	Recreation, Wildlife, Freshwater	1042
		Deadman Creek (4DB)	III	Recreation, Wildlife, Freshwater	1843
		Unnamed (4DC)	III	Recreation, Wildlife, Freshwater	1261
		Wilson Creek (4DD)	II	Recreation, Coldwater fisheries, Wildlife, Spawning, Freshwater	1162
		Coy Creek (4DE)	III	Municipal, Recreation, Coldwater fisheries, Wildlife, Freshwater	1914
		Bear Creek (4DF)	III	Recreation, Coldwater fisheries, Wildlife, Freshwater	1478
	South Fork Tule River 1803000603	Unnamed (4EI)	III	Recreation, Wildlife, Freshwater	903
		Miners Creek (4EJ)	III	Recreation, Wildlife, Freshwater	954

¹ Hydrologic Unit Codes (HUCs) were designated by the U.S. Geological Service (USGS) in conjunction with other agency input.

		Graham SW (4FA)	IV	Agriculture, Freshwater	736
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The TRRP project area encompasses only a portion of the total acres present within any sub-watershed. Since Alternative 3 proposes the most acres treated, approximately 2,815, Table 4 below shows the maximum acres potentially affected by the project. Map 3 displays where the project resides within each sub-watershed.

Table 4 – Percent of each subwatershed potentially affected by the project based on acreage

Subwatershed Number	Subwatershed Name	Subwatershed Acres	Project Acres	Percent Affected
4CA	Deep Canyon	1234	8	0.6
4CB	Long Canyon	2608	15	0.6
4CC	Coffee Canyon	1521	86	5.7
4CD	Headwaters of Long Canyon	1760	346	19.7
4DA	Stevenson Gulch	1042	115	11.0
4DB	Deadman Creek	1843	694	37.7
4DC	Unnamed	1261	491	38.9
4DD	Wilson Creek	1162	259	22.3
4DE	Coy Creek	1914	713	37.3
4DF	Bear Creek	1478	1	0.1
4EI	Unnamed	903	43	4.8
4EJ	Miners Creek	954	43	4.5
4FA	Graham SW	736	1	0.1

Of the 13 named sub-watersheds (7th field HUCs), only four contain stream channels that directly overlap portions of the project area. These include Coy Creek and its tributaries (sub-watershed 4DE), Wilson Creek and its tributaries (sub-watersheds 4DC and 4DD), and Deadman Creek (sub-watershed 4DB). Field verification of the stream layer was conducted by the District Hydrologist. The portions of Wilson Creek and Deadman Creek that overlap the project area were identified as intermittent reaches, becoming perennial much lower in the drainage. Coy Creek also has segments that were identified as intermittent; however, two segments are considered perennial within the project area. Two of the subwatersheds, Bear Creek, and Wilson Creek, contain long term monitoring sites. These long term monitoring sites follow regional Stream Condition Inventory (SCI) protocol (see Courter 2014 for more detail on these streams).

In Wilson Creek, 1.6 miles are perennial and 1.7 miles are intermittent. Remaining drainages are ephemeral channels. Average stream shading along the reach provides approximately 82 percent cover. Water chemistry measured include: total alkalinity, pH, and stream temperature. Total alkalinity results are 80 ppm CaCO₃ while the pH was slightly acidic at 6.5. Recorded stream temperature for the day of the survey was 14 degrees Celsius. Average amounts of large woody debris were 0.68 m³/m. Results from the SCI survey conclude the stream is within natural variability, has no apparent organic pollution, good water quality, and has an average canopy cover shading of 82 percent. The site is in a great location to monitor for changes in the watershed due to the stream being a stable sensitive system. Aquatic species collected in 2006 indicate water quality is excellent with no apparent organic pollution.

The perennial portions of Coy Creek comprise of moderate to high gradient, naturally stable, cobble dominated B3 channel types with some bedrock control scattered throughout the creek. Approximately 8.0 miles of stream flow through this watershed, 1.0 miles are perennial and 7.0 miles are intermittent. Remaining drainages are ephemeral channels.

The terrain is very steep as Bear Creek ephemeral tributaries begin at the top of Slate Mountain. Approximately 4.9 miles of stream flow in this watershed, 3.1 miles are perennial and 1.8 miles are intermittent. Remaining drainages are ephemeral channels. Private land is at the top and the bottom of this stream's drainage and much of the perennial stream is on private lands.. Average stream shading provides approximately 91 percent cover throughout the reach. Average amount of large woody debris was 0.12 m³/m. Water chemistry measured total alkalinity, pH, and stream temperature. Recorded total alkalinity was 180 ppm CaCO₃. The pH was neutral at 7.0. Recorded temperature for that day was 12 degrees Celsius. Aquatic species collected in 2008 indicate water quality is very good with possible slight traces of organic pollution.

There are no natural lakes or ponds in this area.

Introduction of non-native species into the Sierra Nevada has adversely affected a number of species. Jennings (1996) notes that a significant number of Sierran amphibian species have shown dramatic declines in abundance, distribution, and diversity due to a number of factors including the introduction of aquatic predators. Introduced amphibian predators present in the Tule River include brown trout and bullfrogs. Brown trout have been found in the main stem Tule River, are native to Europe (Moyle 2002) and are known to affect amphibian behavior and abundance (Katts and Ferrer 2003, Orizaola and Brana 2003). Bullfrogs are known to predate upon native amphibians (Kupferberg 1996) and have been observed in The Tule River.

Known stream channel conditions within in each sub-watershed are discussed in detail in the TRRP Hydrology Report (incorporated by reference, J.Courter 2014).

Summary of Affected Environment

Sub-watersheds potentially affected by the Tule River Reservation Protection (TRRP) project are either class III or IV streams, with the exception of one sub-watershed, Wilson Creek (4DD), as a class II. Most of these streams are a combination of intermittent and ephemeral channels. The terrain overall is steep creating moderate to high gradient stream channels. Both SCI surveys are within their range of natural variability and are located in a stable sensitive riparian ecotype, which allows for detection of changes in key features to the overall stability and health of the streams. Cumulative Watershed Effects analysis for existing conditions concludes no sub-watersheds are over threshold of concern (TOC). TOC ranges from approximately 0% used to 44% used.

Mountain Yellow-legged Frog - Species and Habitat Account

Status and Distribution: The mountain yellow-legged frog (MYLF) is endemic to the southern Sierra Nevada and once was a vital species within many aquatic ecosystems. MYLF were historically one of the most abundant vertebrates in high Sierra Nevada lakes and streams (Grinnell and Storer 1924, Storer 1925). These frogs are endemic to the southern Sierra Nevada and are vital species in these aquatic ecosystems, functioning as predators, abundant prey, and agents of nutrient and energy cycling (Finlay and Vredenburg 2007). By 1915, MYLFs became rare to extinct in lakes containing non-native trout, while remaining common to abundant in most fishless lakes

(Grinnell and Storer 1924). Extensive surveys in the Sierra Nevada clearly demonstrate the strong detrimental impact of introduced trouts on *R. muscosa* populations (Bradford 1989, Knapp and Matthews 2000). Prior to 2007 the mountain yellow-legged frog was considered a single species *Rana muscosa sensu lato*. Research by Vredenburg et al. (2007) resulted in splitting the northern populations of mountain yellow legged frogs into two species, *Rana muscosa* northern DPS and *Rana sierrae*. As a result, in 2012, *R. muscosa* was listed as endangered under the California Endangered Species Act (CFGF 2012) and in July 2014 the Mountain yellow-legged Frog northern distinct population was listed as endangered under the federal Endangered Species Act (USFWS 2014).

Current studies indicate that the MYLF is continuing to decline and are on trajectories toward extinction (USFWS 2014, Bradford et al. 2011). Extensive research identified two primary factors for this decline. The first factor is the introduction of nonnative trout, which prey on MYLFs, compete with them for food, restrict their breeding to marginal, shallow habitat, and fragment remaining populations (Bradford et al. 1993, Bradford et al. 1994, Knapp and Matthews 2000, Vredenburg 2004, Finlay and Vredenburg 2007). The second factor is the recent spread of the amphibian chytrid fungus (*Batrachochytrium dendrobatidis*), a recently discovered fungal pathogen (Weldon et al. 2004) that causes a highly infectious disease – chytridiomycosis – in many amphibian species. Studies indicate it recently spread into the Sierra Nevada (Morgan et al. 2007, Rachowicz, et al. 2006) and has infected nearly all remaining MYLF populations including those in SEKI and Yosemite National Park.

In the Sierra Nevada, the MYLF range from the Monarch Divide south to Dunlap and Taylor meadows (Sequoia National Forest, CDFG 2011, Vredenburg et al. 2007). It also occurs in the Transverse and Peninsular Ranges in southern California. In the Sierra Nevada, the taxa range from approximately 4500 feet to more than 12000 feet in elevation (Vredenburg et al. 2005). Most remaining populations occur on public lands. In the Sierra Nevada, MYLF can be found on the Inyo and Sequoia National Forests, and in Kings Canyon and Sequoia National Parks. Several historic populations were documented throughout Sequoia National Forest from 1954 through 1970, with most noted detections recorded around meadows environments. Subsequent re-surveys have been conducted Forest-wide within these historic locations, and other areas of suitable habitat (Martin 1992, Cal Academy of Sciences 2001 and 2002 unpublished reports, other Forest Service surveys). However, no MYLFs were detected at any of these historic sites. Today, only three existing populations of this species have been documented on the Forest, all of which occur in the Golden Trout Wilderness. Limited surveys of suitable habitat in the TRRP Project area were conducted in 2010 but no detections of MYLF were found. Review of the Natural Diversity Database also shows no prior occurrence of MYLF in the project area.

Life History: Breeding occurs shortly after snowmelt. Females deposit eggs in clusters attached to vegetation, granite, and under undercut banks (Vredenburg et al. 2004). Eggs hatched in 18-21 days (see review in Vredenburg et al. 2005). Tadpoles require 2-3 summers to metamorphose (Bradford 1983) and juveniles reach sexual maturity in an estimated 3-4 years (Vredenburg et al. 2005). In the southern Sierra, current breeding most commonly occurs in permanent, deep lakes (Knapp and Matthews 2000, Knapp et al. 2003). Frogs used to breed in streams and meadows (Zweifel 1968). Because larvae take two to three years to metamorphose, successful breeding requires permanent water (Bradford 1983). Similar to tadpoles, adults and sub-adults seek warmer water, and in one study, the abundance of frogs within a lake was significantly associated with warmer water (Bradford 1984). Adults are long lived with a maximum recorded estimated age of

14 years (Matthews and Miaud 2009). Frogs appear to use a restricted set of lakes with suitable microhabitats for breeding and overwintering, and then disperse into a greater number of sites during the summer months for feeding (Matthews and Pope 1999, Matthews and Preisler 2010, Pope and Matthews 2001). Frogs are commonly found basking in open areas near cover and water (Grinnell and Storer 1924, Mullally and Cunningham 1956, Storer 1925).

Habitat: The MYLF is highly aquatic and is found in a variety of habitats including lakes, ponds, tarns, wet meadows, and streams (Grinnell and Storer 1924, Mullally and Cunningham 1956). The habitat includes sunny riverbanks, meadow streams, isolated pools, and lake borders in the southern Sierra Nevada. The species seems to prefer sloping banks with rocks or vegetation to the water's edge (Stebbins 1985). This frog is usually found near water, but it may cross upland areas while moving between summer and winter habitats (Matthews and Pope 1999). Wintering sites include areas nearshore under ledges and in deep underwater crevices (Matthews and Pope 1999). Mullally and Cunningham (1956) found frogs more commonly along shallow, rocky shorelines often interspersed with vegetation rather than areas with large boulders from talus slope or sandy unprotected shorelines. Similarly, frogs selected undercut banks and willows in August and rocky habitats in September and October (Matthews and Pope 1999).

Aquatic habitats that are used by MYLF for breeding purposes must maintain water during the entire tadpole growth phase, which can last for up to 2 years. Lacan et al. (2008) concluded that desiccation of tadpoles in habitats that dry during the summer was an important cause of mortality, and found little evidence of winterkill in shallow water habitats (also Bradford 1983). Larvae graze on algae and diatoms in the silt along rocky bottoms in streams (Zeiner et al. 1988). An open or semi-open canopy of riparian vegetation (canopy overstory not exceeding 85 percent, Backlin et al. 2013) is needed to ensure that adequate sunlight reaches the stream to allow for basking behavior and for photosynthesis by benthic algae and diatoms that are food resources for larval MYLF. . None of the low gradient stream habitat within the project area was determined to be suitable for MYLF reproduction because of the swift spring runoff flows.

In consultation with the US Fish and Wildlife Service for the programmatic Biological Assessment for the MYLF in Region 5, suitable breeding habitat typically occurs above 4,500 feet in elevation and includes the following: permanent water bodies or those hydrologically connected with permanent water such as lakes, streams, rivers, tarns, perennial creeks (or permanent plunge pools within intermittent creeks), and pools (such as a body of impounded water contained above a natural dam) and their surrounding areas up to a distance of 25 meters (82 ft). Based on this definition there are a total of 85 acres of suitable habitat available in the TRRP Project area.

Proposed Critical Habitat: Approximately 766,691 acres of NFS lands were designated as Proposed Critical Habitat for the Sierra Nevada yellow-legged frog, and 21,679 acres for the southern mountain yellow-legged frog in the Sierra (USDI 2001). The Tule River Reservation Protection Project is not within proposed critical habitat for the MYLF (USDI 2010). The nearest proposed critical habitat lies within the Little Kern River Basin in the Golden Trout Wilderness approximately 12 air miles north east of the project area.

VI. EFFECTS OF THE PROJECT ALTERNATIVES

Risk Factors and Management Concerns for Mountain Yellow Legged Frog

As of the writing on this BA (updated August 2014) there are no specific management directions for this species. However, USFWS is currently considering Critical Habitat and has listed the northern DPS of mountain yellow-legged frog as endangered. Fishless streams, riparian areas, and availability of refugia sources on slopes directly adjacent to waterways are important habitat characteristics for this species. The TRRP Project area is within the historic range for this species. However it is not within any area identified as proposed for Critical Habitat designation.

Riparian Conservation Areas (RCA) associated with streams, meadows, seeps, and springs provide some protection to habitat by limiting impacts from management projects.

Evaluation criteria are:

1. Introduction of non-native fish
2. Spread of bull frogs (invasive non-native) and other vectors for Chytrid fungus
3. Sustainable protection of streams from degradation;
4. Sustainable riparian habitat
5. Availability of large (> 15" diameter at small end) down woody debris for shelter;
6. Effects of fire during migration and to migration habitat

Direct and Indirect Effects:

Introduction of non-native fish

Introduced fish present in all the streams in areas they did not naturally occur has contributed to the decline of this species forest-wide. This alternative is unlikely to affect this factor contributing to decline of this species.

Spread of bull frogs (invasive non-native,) and other vectors for Chytrid fungus

Bull frogs are known to occur in the lower sections of the Middle Fork Tule River at elevations between 1000 -3000 feet. These occurrences are believed to have resulted through past fish stocking programs by the State of California as well hydrologically connected stock ponds developed on private property. Chytrid fungus which is spread by bull frogs and by other means has severely limited the distribution of MYLF in some high elevation areas of the Forest. At present there have been no detections of bullfrogs in the TRRP Project area. Fish stocking by the California Department of Fish and Wildlife is limited to portions of the Middle Fork Tule River. Some rainbow trout occur in the lower reaches of Bear Creek, Coy Creek and Wilson Creek where they intersect with stocked portions of the main stem of the Tule River. The majority of the intermittent streams within the TRRP project area do not contain trout due the variability of water and relatively steep terrain. Therefore any limited recreation use provides a low risk for the transmission of chytrid fungus from human factors. Implementation of Alternative 3 is unlikely to result in increased foot traffic within streamside management zones (SMZs), and therefore is also not anticipated to alter the current disease conditions that may exist for MYLF.

Habitat Quality and Quantity – Sustainability stream environments

The MYLF requires fish free streams with clear running water and back water areas. Functioning meadows are also good habitat unless non-native bullfrogs or fish are present. Actions that result in direct alteration of streamside vegetation, bank structure, or that promote increased delivery of sediment to waterways have the potential to lower habitat suitability.

The potential for substantial disturbance to any undetected MYLFs or their habitat is anticipated to be low with implementation of Alternative 3. An estimated 85 acres of habitat is found within the project area (comprising both intermittent and perennial streams). Habitat conditions throughout most of the project area are considered of lower breeding quality due to the relatively steep slopes, lower water volume (headwater areas) and limited availability of plunge pools in intermittent reaches. The majority of stream corridors are densely vegetated with limited openings, decreasing opportunity for basking activity. Design criteria have stipulated appropriate streamside management zones widths for the protection of riparian habitats. For example, perennial stream reaches along Coy Creek contain SMZ buffers widths well in excess of the 82 feet as recommended in previous consultation with the US Fish and Wildlife Service (Table 5). This will prevent substantial alteration of existing riparian vegetation, maintain stream bank structure, and maintain the presence of large woody debris. Use of hand treatments to cut small trees and brush, coupled with pile and burn, jack pot pile burn, or understory burn methods, provides the highest flexibility for the protection of streamside reaches and seeps. Retention of the SMZ buffer leave a filtration strip to stop sediment from traveling into the stream. Appropriate implementation of Best Management Practices will further work to decrease transport of sediment as a result of implementation.

Streamside management zones for intermittent streams were established at 50 feet on each side of the stream (Table 5). The stated distance recommended by the US Fish and Wildlife Service is 82 feet. Approximately 30 acres of riparian habitat adjacent to intermittent streams would be treated. This would include hand thinning of small trees (<12" dbh) and brush outside of the 50' SMZ but within the 82' distance. No hand thinning or direct lighting of fire would occur in the actual 50' SMZ. These actions are anticipated to improve fire resilience and protection of riparian habitat over the long term, provide more openings along the forest floor, and more light for basking activity important to the MYLF. The area within the first 50 feet adjacent to the creek would not receive any treatment and continue to provide adequate buffer strip to trap sediment. Prescribed burn treatments include pile and burn or jack pot pile burn methods that occur under climatic condition (late fall) to limit fire severity and resource damage. This will leave a mosaic of untreated areas within any unit as well as the stated buffer area adjacent to the stream, where no treatment would occur. These actions along with BMPs stated should protect desirable aquatic habitat.

The Tule River Reservation Protection Project was included in the USDA Forest Service Region 5 Biological Assessment for the three amphibians listed by the US Fish and Wildlife Service (which included the MYLF). It was determined that the action alternatives for the Tule River Reservation Final Environmental Impact Statement which is tiered to the Regional Biological Assessment may affect and is likely to adversely affect the mountain yellow-legged frog. Alternative 3 for the Tule River Reservation Final Environmental Impact Statement will not affect designated Suitable Habitat for the mountain yellow-legged frog. As yet no clarifications for this project have been requested by US Fish and Wildlife Service (July 29, 2014) as part of the process of review and issuance of a Biological Opinion on the USDA Forest Service Region 5 Biological Assessment for

the three amphibians listed. The Draft Biological Opinion has not been released at this time (July 29, 2014).

Table 5 – Streamside Management Zone, Riparian Conservation Areas, and Special Aquatic Features Width.

Subwatershed Name	SMZ Width (in feet)	RCA Width (in feet)	Special Aquatic Features Width (in feet)
Deep Canyon	<50 ephemeral	NA	100
Long Canyon	50	100	100
Coffee Canyon	<50 ephemeral	NA	100
Headwaters of Long Canyon	50	100	100
Stevenson Gulch	50	100	100
Deadman Creek	50	100	100
Unnamed	50	100	100
Wilson Creek	100	200	100
Coy Creek	200 ²	300 ¹⁴	100
Bear Creek	50	100	100

Sustainable riparian habitat

Range contraction has occurred over the past 20 years and the species is threatened with extinction. As the risk of widespread high intensity fire increases with predicted climate: seeps, riparian conservation areas and streamside management zones may burn eliminating the potential beneficial habitat. This thinning project will reduce the risk to riparian areas of high intensity fires and the spread into streamside management areas.

Table 5 shows a summary of stream management zones and riparian conservation areas set aside for protection of aquatic organisms including the MYLF suitable habitat. The streams with 100 to 200 ft stream management zone widths have permanent year round water within the project area. The streams that have 50 foot SMZ are intermittent and have no standing water year round in most years.

Availability of large (> 15" diameter at small end) down woody debris for shelter

Available snags are anticipated to remain at current levels in the short term and likely increase with the next drought cycle. These factors will continue to provide a recruitment source of large woody debris throughout the project area. The high abundance of snags and down woody debris on a landscape level as is found within the project area, can contribute to fire spotting, higher fire intensity, severity, and therefore greater resistance to control. Treatments as proposed will reduce high levels of ladder fuels (shrubs and small trees) and ground fuels (less than 8" in diameter) which greatly contribute to increased flame heights and high severity fire. Measure will be taken to

² Lower portion of subwatershed only, Section 10, NW corner; Otherwise 100 feet SMZ and RCA is 200.

retain adequate large woody debris (10-20 tons per acre) across the landscape, and to retain existing large woody debris in SMZs which are utilized for hiding cover by the MYLF. Post treatment adequate levels are anticipated to be present life cycle needs.

Effects of managed fire during migration

Fire occurring at the time of migration would have an effect if the species is present in the watershed. This alternative should reduce the likely hood of high intensity fire killing all shrubs and reducing riparian vegetation. The timing of managed fires should not coincide with peak activity of MYLF.

Cumulative Effects

The cumulative effects discussion is bounded by the South Fork and Middle Fork Tule River watersheds (6th order HUC) unless there is rationale to support a conclusion that effects of this project would contribute to a decline or cumulative effect that extends beyond those boundaries. The cumulative effects of Alternative 3 appear to result from equestrian and foot trails and roads in the area; cattle grazing; risk of fire, warming stream and air temperatures; and reduced snow pack.

Loss of individual MYLFs from crushing/killing/disturbance: Foraging or dispersing MYLF could become crushed by motorcycles, horses, mountain bikes, and cars or potentially even by hikers. The use of heavy equipment for bridge, and culvert work on the Forest Service roads which cross the streams could crush them. Trail work could result in crushing frogs. This work is often within 300 feet of streams, which is the most likely location for MYLF to reside during most months of the year.

Habitat alteration from sedimentation: Runoff from trail surfaces can be a source of sedimentation and stream turbidity. Continual daily use of trails by the various public users can cause loss of stream banks at raw crossings, loss of plant cover, increase in bare ground, soil compaction, and erosion. Trail use by OHV can have more concentrated use during a shorter period of time, but is also more closely monitored than is everyday use. Impacts that increase with increased trail use are trail widening, direct displacement of soil (especially if the soil is wet), and deterioration of water diversion structures, such as water bars. In order to reduce erosion rates, the steepness and lengths of trails need to be reduced (Wilshire et al. 1978). This can be accomplished by rerouting overly steep trails and by maintaining water diversion structures.

The use of heavy equipment for bridge, culvert, and trail work can cause temporary sedimentation, particularly during the first year following construction, but trail and road maintenance and improvement work is occurring for the purpose of reducing longer-term sediment delivery to streams and will be an overall benefit to aquatic habitats.

Mountain yellow-legged frogs can be affected indirectly as a result of sedimentation causing a reduction of macro-invertebrates, which is a food source. Sedimentation can fill pools, further reducing water depth, thus reducing cover habitat. Sediment delivery to aquatic environments can increase turbidity, increase water temperatures, and lower dissolved oxygen. Sedimentation can smother egg masses at MYLF reproductive sites. If MYLF were to be affected by sedimentation, this would be undetectable with current sampling.

Water quality effects, risk of pollution from petroleum spills at the natural crossings:

Motorcycles or OHV have the potential to leak or spill petroleum at the stream crossings where no bridge occurs. Both can crash, fall or drive off trail into the streams. If oil products were to enter

the streams, they could affect aquatic life downstream. Any trail construction equipment used to build bridges, upgrade culverts, and construct trails would be following BMPs and refueled at locations away from streams. Within the Monument all OHVs are restricted to designated roads only therefore this restricts traffic to a limited subset of area. Overall use of the project area from these use types is extremely low.

Horses may defecate while crossing streams. These occurrences are generally widely dispersed and not expected to be concentrated or continuous, as for instance, when horses are grazing a fenced area. Therefore, it is not likely that any water quality issues would result to aquatic species from these isolated occurrences.

Changing snowpack and warming trends: Decreased snow pack and winter warming can change the period of peak water and change the later summer flows. This has the potential to change perennial streams into intermittent streams thus eliminating or reducing suitable breeding habitat. In addition warming water may make the habitat unsuitable for tadpoles by late summer.

Fire: Projected warming trends in climate may increase frequency and change seasons of peak fire earlier. Earlier fire may influence habitat for amphibians while they are actively moving around on the surface. This could result in reduction of upland habitat for migration. Alternative 3 will increase the resistance of forested stands to the effects of stand-replacing fire and thus may decrease the risks to streams, riparian, and upland habitats. In addition, by reducing the likelihood of unmanageable fire moving up into higher elevations it has less likelihood of burning into other watersheds that could contain mountain yellow-legged frogs.

Chytrid fungus has spread through invasive and native species who are carriers. These species will not be altered over time with this project. However it is likely that a solution to Chytrid fungus will be found, making it important to maintain available good quality habitat at higher elevations.

Determination

As yet, there has been no observation within the project area of MYLF. Since trails are within the project area and within the riparian and stream side management zones, it is possible that MYLF could be traveling overland during the wet season and become crushed by vehicles used by crews. Hikers, equestrians, or bicycles in the area of streams may crush frogs. Individual MYLF in streams may be affected at localized sites where trails result in sediment delivery or water quality effects to streams from public use and by trail work and construction. The thinning activities for this project will not thin in stream management zones and will only use hand thinning in the riparian buffers. We do not anticipate crushing or harming MYLF during the hand thinning or slash removal.

Determination of Effects

It is my determination that Alternative 3 for the Tule River Reservation Final Environmental Impact Statement which is tiered to the Regional Biological Assessment may affect and is likely to adversely affect the mountain yellow-legged frog.

It is my determination that Alternative 3 for the Tule River Reservation Final Environmental Impact Statement will not affect proposed Critical Habitat for the mountain yellow-legged frog.

It is my determination that Alternative 3 for the Tule River Reservation Final Environmental Impact Statement will not affect designated Suitable Habitat for the mountain yellow-legged frog.

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